

CP PRECALCULUS PROJECT: BIORHYTHMS

At the end of the 19th century, a German physician named Wilhelm Fleiss tried to establish a mathematical relationship between an individual's date of birth and one's death and/or illnesses. Others have since expanded and adjusted the original idea, and the concept is known as "biorhythm."

According to this idea, there are three biological patterns that begin at birth and affect disposition during the course of a lifetime. These patterns do not determine what will happen on a particular day, only how the individual is likely to feel as events occur. There is a physical cycle with a 23-day period, an emotional cycle with a 28-day period, and an intellectual cycle with a 33-day period.

On the day of your birth, each pattern starts at a neutral phase and begins to rise in a positive phase, during which the energies and abilities associated with the cycle are high. Then, gradually declining, the patterns cross the midpoint halfway through their complete periods and continue into a negative phase in which capabilities are low. Then increasing amounts of energy are picked up as this negative phase turns upward into a positive phase, and the whole cycle begins again.

FOLLOW THE INSTRUCTIONS BELOW TO DESIGN YOUR BIORHYTHM EQUATIONS.

1. WRITE DOWN THE MONTH, DAY, AND YEAR OF YOUR BIRTH.
2. COMPUTE THE CHRONOLOGICALLY NUMBERED DAY OF THE YEAR IN WHICH YOU WERE BORN. *EXAMPLE: MARCH 26TH IS THE 85TH DAY OF THE YEAR. 31 DAYS IN JANUARY + 28 DAYS IN FEBRUARY + 26 DAYS OF MARCH = THE 85TH DAY (PROVIDED THE YEAR OF YOUR BIRTH WAS NOT A LEAP YEAR, IN WHICH CASE YOU WERE BORN ON THE 86TH DAY BECAUSE FEBRUARY HAS 29 DAYS IN A LEAP YEAR.)*
3. EXPLAIN WHY THERE IS A LEAP YEAR AND THE IMPLICATIONS TO OUR CALENDAR OVER TIME. IS OUR CALENDAR PERFECT? IF YOU CANNOT COMPLETELY EXPLAIN OUR CALENDAR, DO SOME RESEARCH. (CITE SOURCES WHEN NECESSARY – PLAGIARISM IS BAD).
4. YOUR GOAL IS TO FIND EQUATIONS FOR EACH PREDICTOR MODEL AND USE IT TO EXTRAPOLATE VALUES PREDICTING DISPOSITION, ACCORDING TO YOUR BIORHYTHM. YOUR FUNCTIONS MUST BE FUNCTIONS FOR SOME RATING OF THE DAY, IN TERMS OF TIME. FOR THIS PROJECT, TIME ZERO REPRESENTS 12:00AM, JANUARY 1ST IN THE YEAR OF YOUR BIRTH. EXPLAIN THE MEANING OF THE VARIABLES YOU WILL USE AND RELATE THEM WITH PROPER FUNCTION NOTATION.
5. TO DATE WE HAVE STUDIED LINEAR, POWER, POLYNOMIAL, RATIONAL, EXPONENTIAL, LOGARITHMIC, SINE, COSINE, AND TANGENT FUNCTIONS. EXPLAIN WHY YOU BELIEVE A PARTICULAR FUNCTION WILL MOST ACCURATELY MODEL YOUR BIORHYTHM EQUATIONS. FOR YOUR CHOSEN FUNCTION, WRITE THE GENERAL FORM AND EXPLAIN THE PRACTICAL SIGNIFICANCE OF EACH PARAMETER INVOLVED AND HOW IT WILL WORK TO TRANSFORM THE INDEPENDENT VARIABLE VALUE INTO THE DEPENDANT VARIABLE VALUE.
6. CHECK WITH INSTRUCTOR TO VERIFY SUCCESSFUL COMPLETION OF STEPS 1-5 ON OR BEFORE WEDNESDAY **DECEMBER 19, 2012.** _____

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****NOTE: STUDENTS ARE NOT TO PROCEED TO STEP 7 UNTIL VERIFICATION OF STEPS 1-5.**

7. DETERMINE VALUES FOR PARAMETERS **A** AND **D** FOR YOUR EQUATION, EXPLAINING YOUR CALCULATIONS AND THE EFFECT ON THE RANGE OF THE FUNCTION.
8. USING THE PERIODS SPECIFIED IN THE INITIAL PARAGRAPHS, COMPUTE THE EXACT VALUE OF **B** FOR EACH BIORHYTHM PREDICTOR MODEL.
9. THE TRIGONOMETRIC FUNCTION USED TO MODEL YOUR BIORHYTHM MAY COMPLETE MANY CYCLES BETWEEN JANUARY 1 AND YOUR ACTUAL BIRTHDAY. CONSIDER BOTH THE SINE AND COSINE FUNCTIONS AND FIND THE **SMALLEST POSSIBLE** HORIZONTAL SHIFT FOR EACH OF YOUR 3 MODELS. USE THESE VALUES TO CALCULATE **C** FOR EACH OF THE THREE EQUATIONS EXPLAINING HOW YOU KNOW YOU HAVE FOUND THE SMALLEST SHIFT.
10. WRITE EQUATIONS FOR EACH OF YOUR BIORHYTHM PREDICTOR MODELS.
11. ENTER YOUR EQUATIONS INTO YOUR GRAPHING CALCULATOR. BE PREPARED TO EXPLAIN HOW YOU CHECKED YOUR EQUATION TO VERIFY THAT IT MAKES SENSE IN THE CONTEXT OF THE PROBLEM AND SHOW YOUR EQUATIONS TO YOUR INSTRUCTOR ON OR BEFORE **JANUARY 4, 2013.** _____
12. DETERMINE YOUR RATING FOR EACH OF THE THREE CYCLES ON JANUARY 16, 2013. ALSO, DETERMINE THE NEXT DATE (AFTER THE DUE DATE) YOU WILL BE AT THE PEAK OF EACH OF THE CYCLES AND DEVELOP A STRATEGY TO FIND WHAT DAY OR DAYS DURING SECOND SEMESTER YOU EXPECT TO BE AT YOUR OVERALL "BEST."
13. THE COMPLETED PROJECT MAY BE IN ANY FORMAT YOU CHOOSE (POSTER, POWERPOINT, WRITTEN REPORT), BUT MUST HAVE A MINIMUM OF: ALL WORK AND ANSWERS FOR STEPS 1-12 SHOWN, PREDICTOR EQUATIONS WRITTEN OUT, GRAPHS OF EACH OF THE THREE BIORHYTHMS (ON THE SAME AXES) FROM JANUARY 1, 2013 TO APRIL 1, 2013, AND THIS NEAT, NON-WRINKLED, NON-SCRIBBLED ON, NON-STAINED, NON-LOST, INITIALED ON TIME, INSTRUCTION SHEET.

CHECKPOINT #6 DUE BY: 12-19-2012

INSTRUCTOR INITIALS _____

CHECKPOINT #11 DUE BY: 01-04-2013

INSTRUCTOR INITIALS _____

COMPLETED PROJECT DUE BY: 01-09-2013

FINAL GRADE _____

STUDENT NAME: _____